

Appl. No. 10/521,180
Amdt. dated August 1, 2008
Reply to Final Office action of March 17, 2008

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-16. **(Cancelled)**

17. **(Previously presented)** A fuel injection valve for internal combustion engines, comprising

a valve body (1) having a bore (3),

a pistonlike valve needle (5) disposed in the bore (3),

a valve seat (9), embodied on the end of the bore (3) toward the combustion chamber

a valve sealing face (7) embodied on the valve needle (5) and cooperating with the valve seat (9) whereby, by the longitudinal motion of the valve needle (5), the opening of at least one injection opening (11) embodied on the end toward the combustion chamber of the valve body (1) is controlled, and

microscope indentations (32; 35; 38) on the valve sealing face (7) and/or the valve seat (9).

18. **(Previously presented)** The fuel injection valve of claim 17, wherein the microscopic indentations (32; 35; 38) are embodied individually and are separate from one another.

Appl. No. 10/521,180
Amdt. dated August 1, 2008
Reply to Final Office action of March 17, 2008

19. (Previously presented) The fuel injection valve of claim 18, wherein the microscopic indentations (32; 35; 38) are embodied as dimples (32).

20. (Currently amended) The fuel injection valve of claim 19, A fuel injection valve for internal combustion engines, comprising

a valve body (1) having a bore (3),

a pistonlike valve needle (5) disposed in the bore (3),

a valve seat (9), embodied on the end of the bore (3) toward the combustion chamber

a valve sealing face (7) embodied on the valve needle (5) and cooperating with the valve seat (9) whereby, by the longitudinal motion of the valve needle (5), the opening of at least one injection opening (11) embodied on the end toward the combustion chamber of the valve body (1) is controlled, and

microscope indentations (32; 35; 38) on the valve sealing face (7) and/or the valve seat (9),

wherein the microscopic indentations (32; 35; 38) are embodied individually and are separate from one another,

wherein the microscopic indentations (32; 35; 38) are embodied as dimples (32), and

wherein the dimples (32), viewed in the circumferential direction of the valve needle (5), have a lesser spacing between one another than in the longitudinal direction of the valve needle (5).

21. (Currently amended) The fuel injection valve of claim 19; A fuel injection valve for internal combustion engines, comprising

a valve body (1) having a bore (3),

a pistonlike valve needle (5) disposed in the bore (3),

a valve seat (9), embodied on the end of the bore (3) toward the combustion chamber

a valve sealing face (7) embodied on the valve needle (5) and cooperating with the valve seat (9) whereby, by the longitudinal motion of the valve needle (5), the opening of at least one injection opening (11) embodied on the end toward the combustion chamber of the valve body (1) is controlled, and

microscope indentations (32; 35; 38) on the valve sealing face (7) and/or the valve seat (9),

wherein the microscopic indentations (32; 35; 38) are embodied individually and are separate from one another,

wherein the microscopic indentations (32; 35; 38) are embodied as dimples (32), and

wherein the dimples (32), viewed in the circumferential direction of the valve sealing face (7), have a greater spacing between one another than in the longitudinal direction of the valve needle (5).

22. **(Previously presented)** The fuel injection valve of claim 18, wherein the microscopic indentations (32; 35; 38) have a spacing (a) from one another of between about 5 μm and 500 μm .

23. **(Previously presented)** The fuel injection valve of claim 17, wherein the microscopic indentations (32; 35; 38) are embodied as grooves (38).

24. **(Previously presented)** The fuel injection valve of claim 17, wherein the microscopic indentations (32; 35; 38) are embodied as groove segments (35).

25. **(Previously presented)** The fuel injection valve of claim 23, wherein the microscopic indentations (32; 35; 38) intersect at least in part.

26. **(Previously presented)** The fuel injection valve of claim 24, wherein the microscopic indentations (32; 35; 38) intersect at least in part.

27. (**Previously presented**) The fuel injection valve of claim 23, wherein the microscopic indentations (32; 35; 38) extend in concentric circles over the entire circumference of the valve sealing face (7) and/or of the valve seat (9).

28. (**Previously presented**) The fuel injection valve of claim 24, wherein the microscopic indentations (32; 35; 38) extend in concentric circles over the entire circumference of the valve sealing face (7) and/or of the valve seat (9).

29. (**Previously presented**) The fuel injection valve of claim 17, wherein the microscopic indentations (32; 35; 38) overlap at least in part.

30. (**Previously presented**) The fuel injection valve of claim 17, wherein the microscopic indentations (32; 35; 38) have a depth between about 0.5 μm and 50 μm .

31. (**Previously presented**) The fuel injection valve of claim 17, wherein the microscopic indentations (32; 35; 38) have a depth between about 3 μm and 20 μm .

32. (**Previously presented**) The fuel injection valve of claim 17, wherein the microscopic indentations (32; 35; 38) have a width (b) of between about 5 μm and 100 μm , preferably between 10 μm and 50 μm .

Appl. No. 10/521,180
Amdt. dated August 1, 2008
Reply to Final Office action of March 17, 2008

33. **(Previously presented)** The fuel injection valve of claim 17, wherein the microscopic indentations (32; 35; 38) are produced by jet machining, laser machining, hard turning, microembossing, spark erosion, or by lithographic or electrochemical methods.

34. **(Previously presented)** The fuel injection valve of claim 23, wherein the grooves (38) are produced by fine turning.

35. **(Previously presented)** The fuel injection valve of claim 30, wherein the microscopic indentations (32; 35; 38) are made after fine machining of the valve sealing face (7) and of the valve seat (9) and the faces are subsequently postmachined by lapping, fine polishing or finishing.

36. **(Previously presented)** The fuel injection valve of claim 31, wherein the microscopic indentations (32; 35; 38) are made after fine machining of the valve sealing face (7) and of the valve seat (9) and the faces are subsequently postmachined by lapping, fine polishing or finishing.